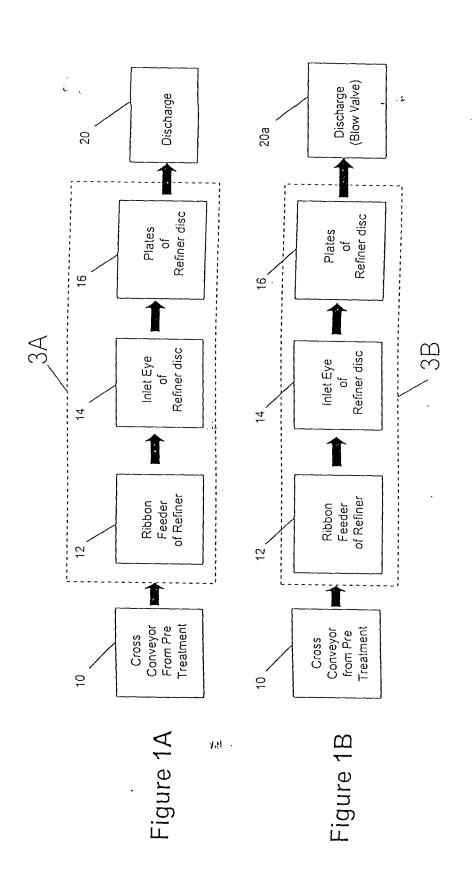


Figure 1



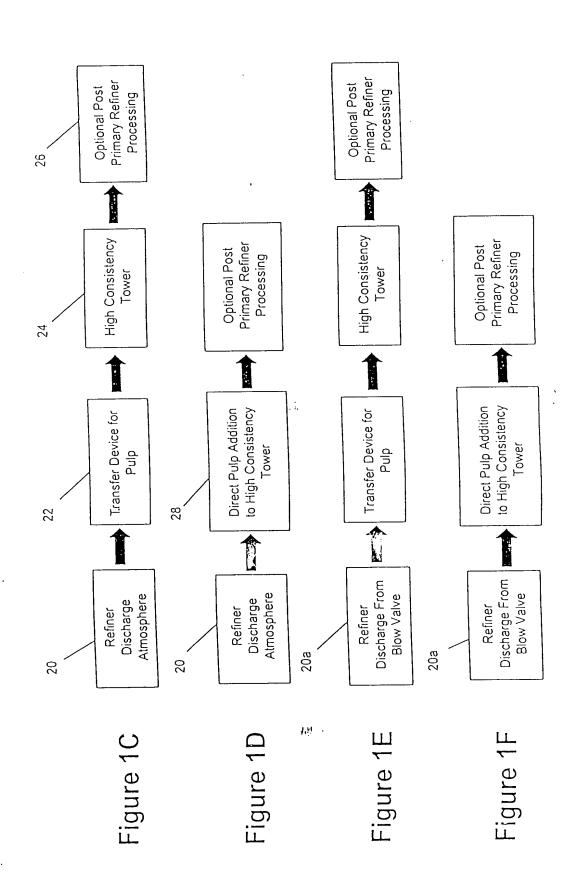
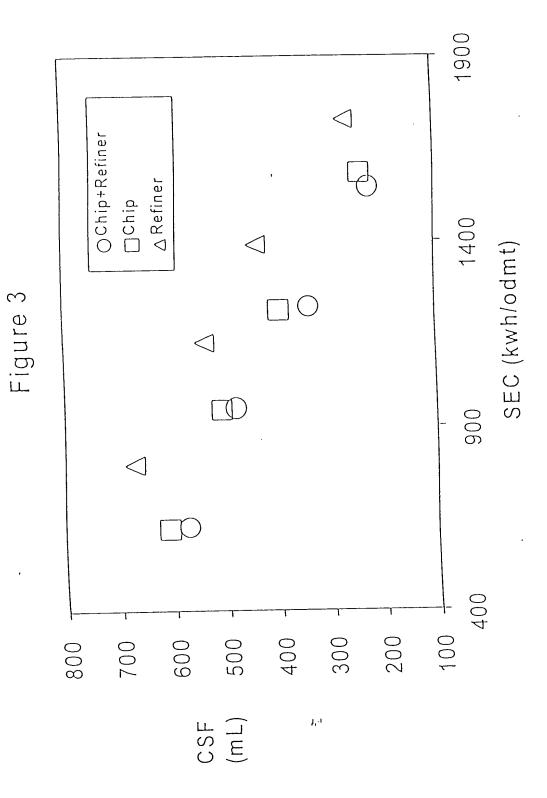
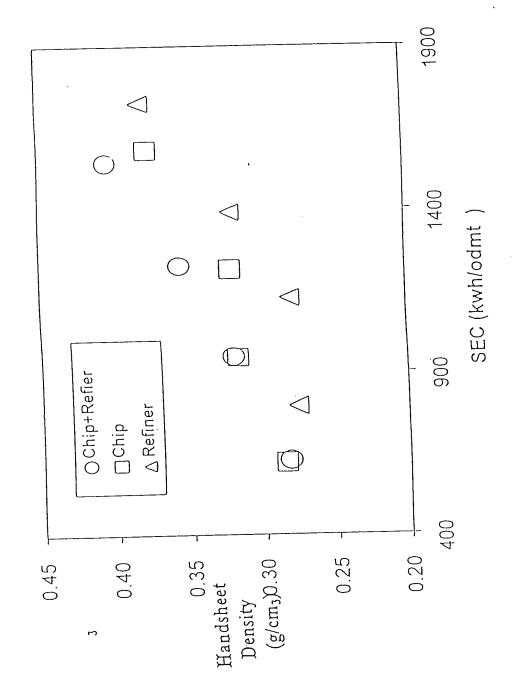


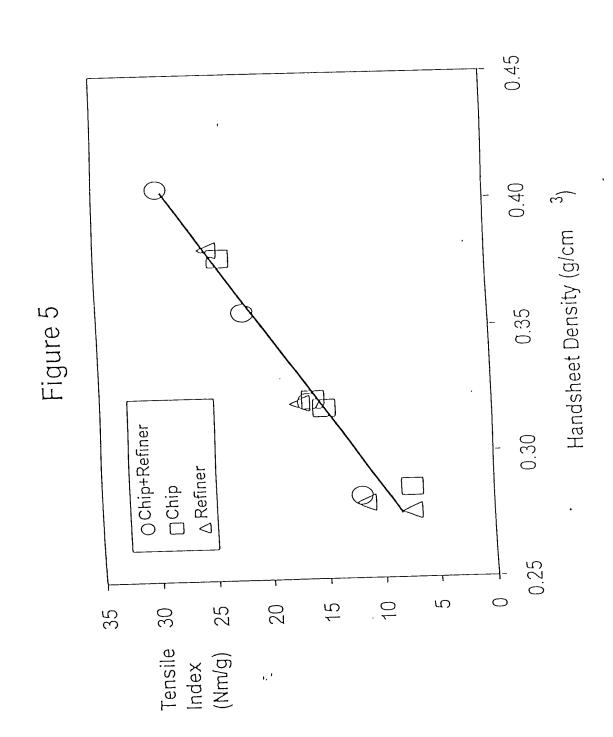
Figure 2

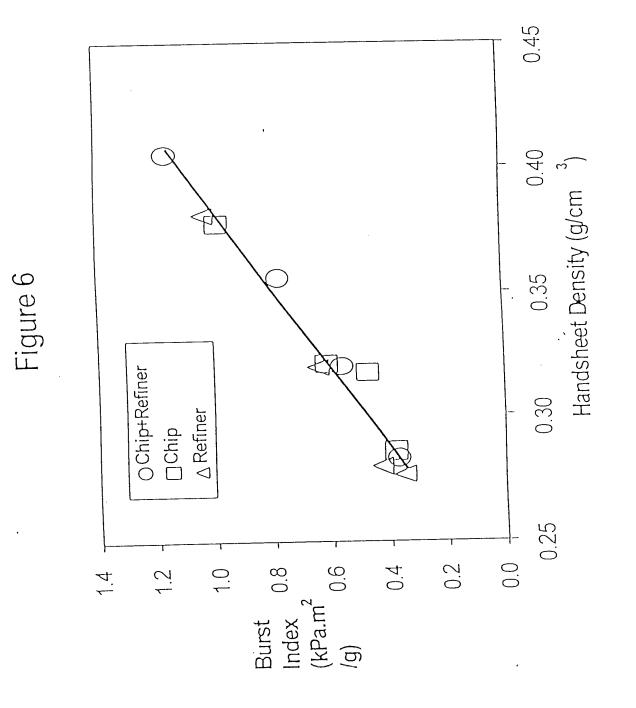
| | | |) | | | | | | |
|-------------------------|-------|----------------|------|------|----------|------|------|---------|------|
| T IGMAN | A2 | £ | 1 | A10 | A11 | A12 | A14 | A15 | A16 |
| | Chic | Chio + Refiner | | | Chip | | CL. | Refiner | |
| Crem. Applied. | | 3.4 | | | 3.3 | | | 4.2 | |
| % I.A % 1402 | | 2.6 | | | 2.4 | _ | | 3.3 | |
| Residual: | | | | | | | | | |
| % H,0, | | 0.29 | | | 0.25 | | | 0.48 | |
| 7-7. Hu | | 8.2 | | | 8.6 | | | 8.2 | |
| Total SEC (kwh/odmiXa) | 947 | 1223 | 1543 | 874 | 1181 | 1531 | 1127 | 1389 | 1729 |
| الرات (m) على الله | 481 | 338 | 223 | 436 | 88 | 225 | 537 | 436 | 366 |
| Ę | 16.4 | 21.9 | 29.3 | 18.4 | 25.1 | 31.1 | 11.4 | 17.1 | 24.9 |
| RITY (cm3/a) | 3.13 | 2.81 | 2.47 | 3.16 | 2.78 | 2.51 | 3.58 | 3.13 | 2.63 |
| BURST INDEX (KPa m2/g) | 0.56 | 0.77 | 1.16 | 0.68 | <u>4</u> | 1.27 | 0.43 | 0.64 | 1.03 |
| TEAR INDEX (mN m2/e) | 2.7 | 3.0 | 4.1 | 3.5 | 3.6 | 4.4 | 2.3 | 2.7 | 3.3 |
| T.E.A.(J/m2) | 5.7 | 9.0 | 15.5 | 7.2 | 11.9 | 16.7 | 3.2 | 6.5 | 11.3 |
| SO RECHUESS | 76.8 | 78.0 | 78.3 | 74.6 | 75.2 | 74.6 | 76.7 | 77.5 | 78.1 |
| % OPACITY | 8.4.4 | 85.2 | 8.38 | 85.0 | 85.6 | 85.3 | 83.7 | | 86.3 |
| SCATT COREE (m)/kg) | 50.7 | 53.4 | 57.7 | 49.2 | 52.3 | 52.7 | 48.4 | 53.3 | 57.1 |
| (Sec. 1) . (1) (Sec. 1) | | | | ,1 | - | | | | |

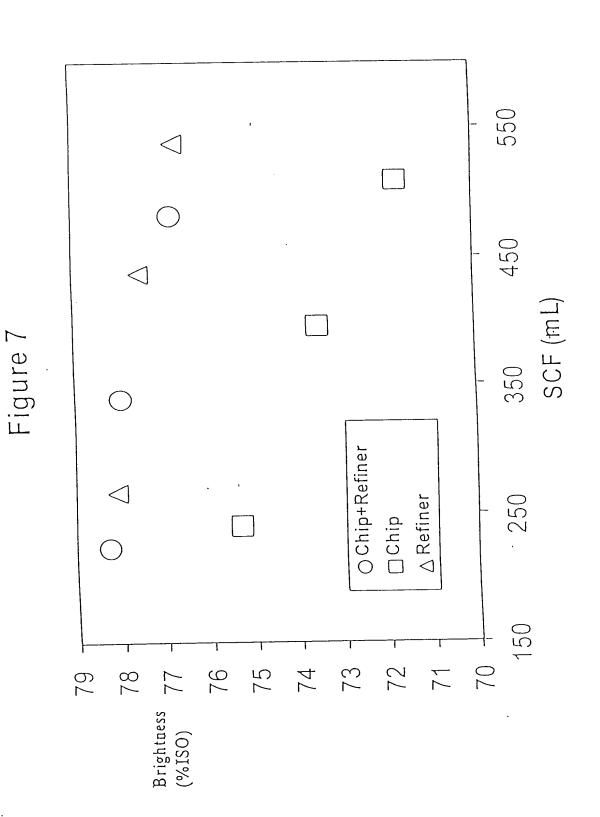
Note: a) A commercial APMP system normally useds about 70% or less SÉC than the lab.











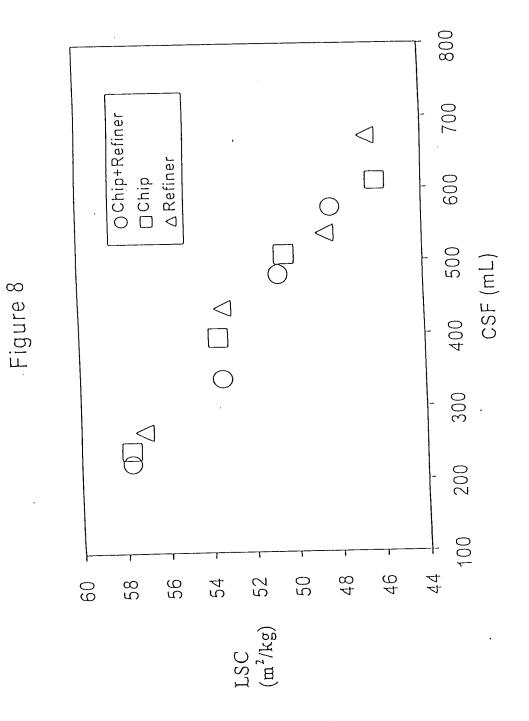
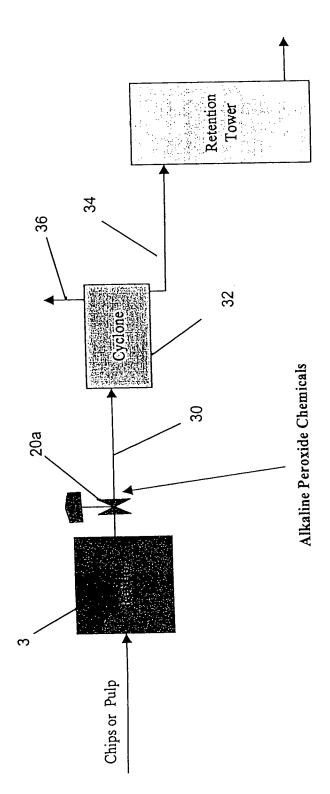


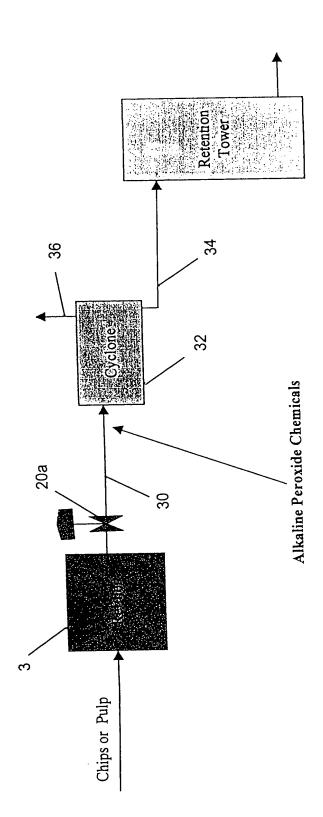
Figure 9

| | | Deciminad |
|--|---------------------------------------|---------------|
| - | Atmospheric | ן ובפסחו ודכם |
| Aspen | | |
| First Stage Impregnation | 0.7 | 0.2 |
| % DTPA | 7:0 | |
| Second Stage Impregnation | <i>L</i> 11 | 3.9 |
| %TA | · · · · · · · · · · · · · · · · · · · | 3.0 |
| % H ₂ O ₂ | J 6 | 3.3 |
| % Silicate | t. C | 0.1 |
| % MgSO4 | 0.1 | |
| Primary Refiner | | 140 |
| Casing Pressure (kPa) |)) - | 2.0 |
| % TA | 0.1 | 2.4 |
| % H ₂ O ₂ | J. Z. C. | 2.6 |
| % Silicate | 4:7 01.0 | 0.1 |
| % MgSO4 | 01.0 | |
| Final Pulp | C 70 | 84.7 |
| Brightness (% ISO) | ٠ ۲ | 9.0 |
| pH Residual | o. c | 0.5 |
| % TA Residual | | 5.1 |
| % H ₂ O ₂ Residual | -; · | 5.4 |
| Total TA Consumed (%) | י יי ני | 3.9 |
| Total H.O. Consumed (%) | 5.7 | |
| 10131 11303 COLI 11301 | | |

Figure 10

| | Atmospheric | Pressurized |
|--|-------------|-------------|
| Birch First Stage Impregnation | 0.2 | 0.2 |
| % DTPA | 7:0 | |
| Second Stage Impregnation | 2.0 | 2.0 |
| % TA | 5:4 C | 2.3 |
| % H ₂ O ₂ | J. C | 2.4 |
| % Silicate | t. 7 | 0.1 |
| % MgSO4 | 0.1 | |
| Primary Refiner | c | 140 |
| Casing Pressure (kPa) | > <u>"</u> | |
| % TA | . 0 | 1.7 |
| % H ₂ O ₂ | 0.1 | 1.7 |
| % Silicate | 0.1 | 10 |
| % MgSO4 | 0.1 | |
| Final Pulp | P C8 | 82.6 |
| Brightness (% ISO) | t:70 C & | 8.0 |
| pH Residual | 0.0 | 0.1 |
| % TA Residual | 7.0 | 90 |
| % H ₂ O ₂ Residùal | . c | 3.2 |
| Total TA Consumed (%) | 3.1 3.6 | 3.4 |
| Total H,O, Consumed (%) | 0.0 | |
| | | |





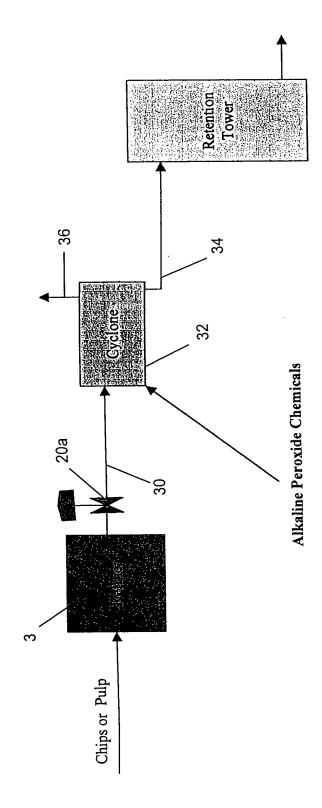
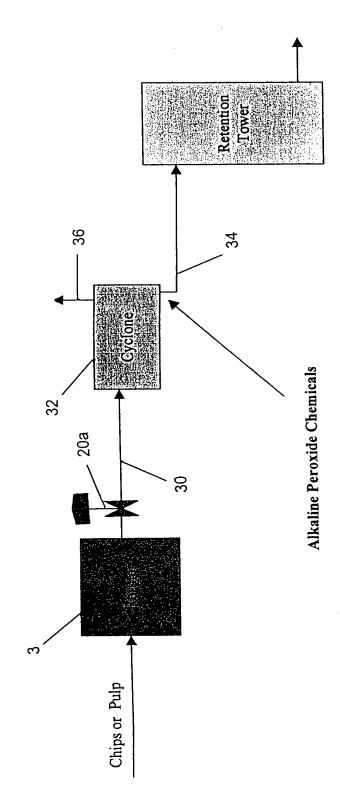


Figure 14



:

FIGURE 15

| Results from Birch and Maple | Birch | | Maple | ole |
|--|-------------|-----------|-----------|-----------|
| Wood Deing Point | Refiner Eye | 욺 | E. | 읆 |
| Sample No. | Al | A2 | A3 | A4 |
| Deimon Roftnor | | | | |
| Conditions at Frimary its inci | C | 0 | 0 | 0 |
| Pressure at Inlet (bar) Pressure in Casing (Bar) | 1.4 | 1.4 | 1.4 | 1.4 |
| | 0.16 | 0.16 | 0.13 | 0.13 |
| %DTPA | 0.16 | 0.16 | 0.13 | 0.13 |
| % MgSO ₄ | 2.10 | 2.3 | 2.5 | 2.5 |
| % Silicate | 1.8 (0.3) | 1.8 (0.5) | 1.2 (0.1) | 1.2 (0.1) |
| % TA (Residual) | 7.4 (1.0) | 2.4 (1.1) | 2.1 (1.8) | 2.1 (2.1) |
| % H ₂ O ₂ (Residual) | 8.9 | 9.0 | 7.4 | 7.6 |
| Final pri | | - | | |
| Final Pulp Properties | 070 | 84.2 | 79.2 | 81.9 |
| Brightness (% ISO) $\frac{2}{6}$ | 0.4.0 | 0.25 | 0.5 | 0.32 |
| Light Absorption Coefficient (III / kg) | 285 | 315 | 320 | 295 |
| Freeness (ml) | | | ı | |

Red Pine 1.2 (0.5) 1.9 (1.1) 8.1 0.2 0.06 2.0 71.2 1.01 82 R. E. A7 1.1 0.9 (0.2) 1.2 (1.7) 9.1 78.8 0.56 47 0.22 0.11 B.L. A6 Spruce 0.8 (0.1) 1.2 (1.3) 8.7 78.2 0.60 49 0.22 0.11 R.E. Table 2. Results From Different Softwoods Final Pulp Properties
Brightness (% ISO)
Light Absorption Coefficient (m²/kg)
Freeness (ml, CSF) Conditions at Primary Refiner Pressure at Inlet (Bar) Pressure in Casing (Bar) % TA ^a (Residual) % H₂O₂ (Residual) Final pH Dosing Point Sample No. % DTPA % MgSO₄ % Silicate ₩ood

1.2 (0.1) 1.8 (1.1) 8.1

0.18

1.8

B. L. A8 71.8 0.84 99

FIGURE 17

Table 3. Results From Softwood Blend Under Elevated Pressure At Primary Refiner.

| Table 3. Results From Softwood Bienu Oliuci Elevated Alexandrian | uci Elevateu i icasare int | | _ |
|--|----------------------------|-----------|--------|
| Dosing Point | Refiner Eye | Blow Line | |
| Sample No. | Ay | OIV. | |
| Conditions at Primary Refiner | | | |
| Pressure at Inlet (Bar) | 2.1 | 6.3 | |
| Pressure in Casing (Bar) | 2.1 | 4.3 | |
| % * | 1.7 | 1.7 | |
| % IA % H ₂ O ₂ (Residual) | 2.8 (1.1) | 2.8 (1.1) | |
| Final pH | 7.6 | C./ | _ |
| | - | | _ |
| Final Pulp Properties | | 73.4 | |
| Brightness (% ISO) | /3./ | 7.5.7 | |
| Light Absorption Coefficient (m*/kg) | | 090 | |
| Freeness (ml) | 4/ | 10 | \neg |
| | | | |

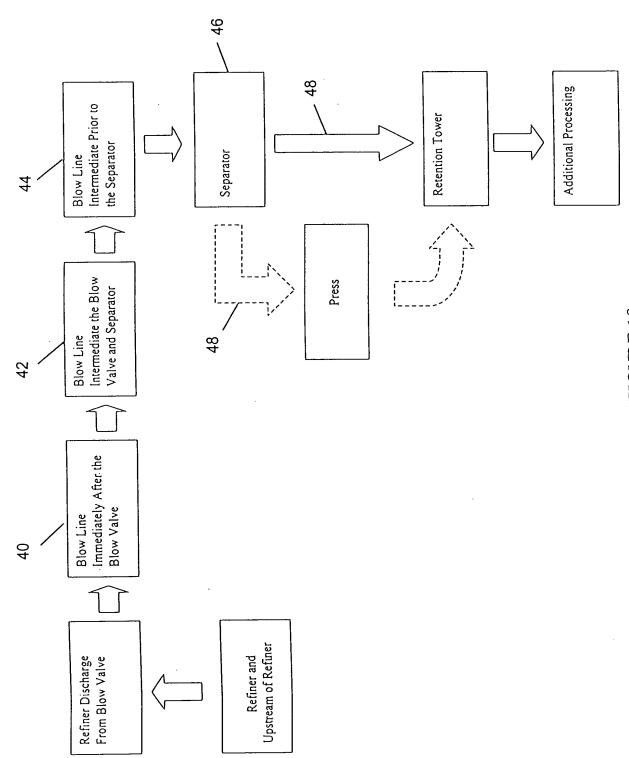


FIGURE 18